

# Solving Systems of Equations

## Elimination Method aka Linear Combination Method (aka Multiplication - Addition Algorithm)

Steps:

1. Arrange the equations with like terms in columns.
2. If necessary, make either the x or y terms opposite by multiplying each term (in one or both equations) by the appropriate number.  
\*You are trying to create opposites.
3. Add the equations and solve.
4. Substitute the value found in Step 3 into either original equation to find the other value.
5. Check your answer.

*Solve each system using the elimination method.*

1) 
$$\begin{array}{r} x - y = 3 \\ x + y = 7 \end{array}$$

2) 
$$\begin{array}{r} a - b = 2 \\ a + b = 2 \end{array}$$

3) 
$$\begin{array}{r} m - 2n = 8 \\ m + 2n = -8 \end{array}$$

4) 
$$\begin{array}{r} -5 = x - y \\ 1 = x + 2y \end{array}$$

5) 
$$\begin{array}{r} a - 2b = 0 \\ a + 2b = 12 \end{array}$$

6) 
$$\begin{array}{r} 3x + y = 8 \\ 3x - 2y = 2 \end{array}$$

7) 
$$\begin{array}{r} 3u - 1/2v = 7 \\ 2u - 1/2v = 4 \end{array}$$

8) 
$$\begin{array}{r} 1 = -2m + n \\ 1 = 2m - 3n \end{array}$$

9) 
$$\begin{array}{r} 3x = 2y - 2 \\ y - 3x = 0 \end{array}$$

10)  ~~$10y = 15x + 17$   
 $15x - 10y = 50$~~

11)  ~~$4x + y = 4$   
 $-4(x - 1) = y$~~

12)  $2p - 3q = 5$   
 $8 = 3p - 3q$

13)  $-10 = m - 3n$   
 $m + 2n = 20$

14)  $2y + x = -7$   
 $3 = x - 3y$

15)  $3c = 3d + 9$   
 $2c + 3d = 1$

16)  $2(x - y) = 14$   
 $x + 2y = -2$

17)  $3(r - 2s) = 6$   
 $r + 6s = 2$

18)  $3(p - 2q) = 6$   
 $2(p + 3q) = -6$

19)  $1/2(a + b) = -1$   
 $a - b = 4$

20)  $2x + 3y = 2$   
 $1/3(2x - y) = -2$

21)  $1/3(x + 9y) = -4$   
 $x - 3y = 0$

22)  $3a - b = 2a - 5$   
 $3b - a = 5$

23)  $2(r - s) = 3 + r$   
 $r = 3s + 4$

24)  $3t - 4z = -6$   
 $3t - 2z = 0$

25)  $-4x + 5y = -36$   
 $5x - 3y = 32$

26)  ~~$4x + 2y = 10$   
 $y = -2x - 10$~~

27)  $6x + 4y = 34$   
 $9 - 2y = x$